WHAT IS CLAIMED IS:

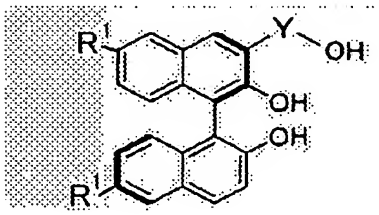
1. An asymmetric reaction catalyst obtained by mixing a pentavalent niobium compound and a triol or tetraol having an optically active binaphthol structure of R or S configuration.

2. An asymmetric reaction catalyst according to claim 1, wherein the niobium compound is represented by the following formula:

NbX_5

(wherein, X is an alkoxide or a halogen atom).

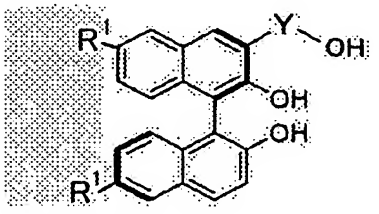
3. An asymmetric reaction catalyst according to claim 1, wherein the triol is represented by the following formula (I):



(I)

(wherein, Y represents a divalent hydrocarbon group and R^1 represents a hydrogen atom, a halogen atom, a perfluoroalkyl group having at most four carbons, or an alkyl group or alkoxy group having at most 4 carbons).

4. An asymmetric reaction catalyst according to claim 2, wherein the triol is represented by the following formula (I):

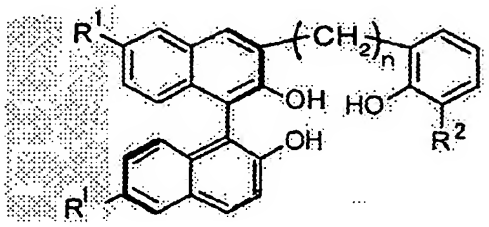


(I)

(wherein, Y represents a divalent hydrocarbon group and R^1 represents a hydrogen atom, a halogen atom, a perfluoroalkyl group having at most four carbons, or an alkyl group or

alkoxy group having at most 4 carbons).

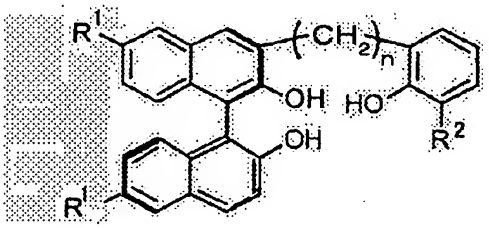
5. An asymmetric reaction catalyst according to claim 1, wherein the triol is represented by the following formula (II):



(II)

(wherein, R^1 represents a hydrogen atom, a halogen atom, a perfluoroalkyl group having at most 4 carbons, or an alkyl group or an alkoxy group having at most four carbons; R^2 represents a hydrogen atom or a hydrocarbon group having 1 to 10 carbons; and n is an integer from 0 to 2).

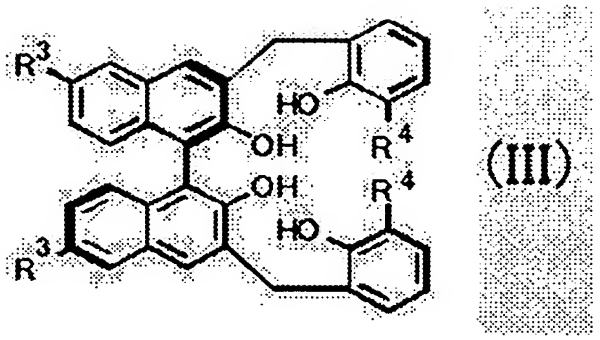
6. An asymmetric reaction catalyst according to claim 2, wherein the triol is represented by the following formula (II):



(II)

(wherein, R^1 represents a hydrogen atom, a halogen atom, a perfluoroalkyl group having at most 4 carbons, or an alkyl group or an alkoxy group having at most four carbons; R^2 represents a hydrogen atom or a hydrocarbon group having 1 to 10 carbons; and n is an integer from 0 to 2).

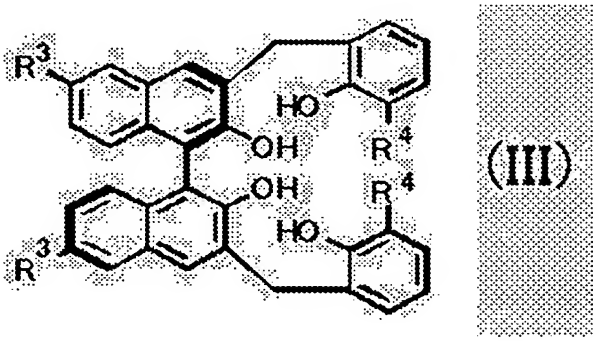
7. An asymmetric reaction catalyst according to claim 1, wherein the tetraol is represented by the following formula (III):



(III)

(wherein, R^3 represents a hydrogen atom, a halogen atom, a perfluoroalkyl group having at most 4 carbons, or an alkyl group or alkoxy group having at most 4 carbons and R^4 represents a hydrogen atom or a hydrocarbon group having 1 to 10 carbons).

8. An asymmetric reaction catalyst according to claim 2, wherein the tetraol is represented by the following formula (III):



(III)

(wherein, R^3 represents a hydrogen atom, a halogen atom, a perfluoroalkyl group having at most 4 carbons, or an alkyl group or alkoxy group having at most 4 carbons and R^4 represents a hydrogen atom or a hydrocarbon group having 1 to 10 carbons).

9. A method for preparing an optically active compound, wherein a reaction substrate represented by $R^5R^6C=N-Z$ (wherein R^5 and R^6, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, an alkoxycarbonyl group, and a hydrocarbon group having a

functional group and Z represents an aryl group or an acylamino group) and a nucleophilic agent are reacted by nucleophilic addition using an asymmetric reaction catalyst according to claim 1.

10. A method for preparing an optically active compound, wherein a reaction substrate represented by $R^5R^6C=N-Z$ (wherein R^5 and R^6, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, an alkoxycarbonyl group, and a hydrocarbon group having a functional group and Z represents an aryl group or an acylamino group) and a nucleophilic agent are reacted by nucleophilic addition using an asymmetric reaction catalyst according to claim 2.

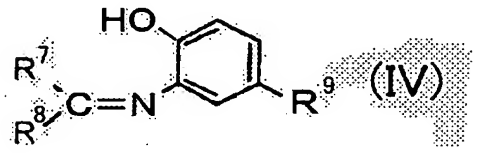
11. A method for preparing an optically active compound, wherein a reaction substrate represented by $R^5R^6C=N-Z$ (wherein R^5 and R^6, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, an alkoxycarbonyl group, and a hydrocarbon group having a functional group and Z represents an aryl group or an acylamino group) and a nucleophilic agent are reacted by nucleophilic addition using an asymmetric reaction catalyst according to claim 3.

12. A method for preparing an optically active compound, wherein a reaction substrate represented by $R^5R^6C=N-Z$ (wherein R^5 and R^6, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, an alkoxycarbonyl group, and a hydrocarbon group having a functional group and Z represents an aryl group or an acylamino group) and a nucleophilic agent are reacted by nucleophilic addition using an asymmetric reaction catalyst according to claim 4.

13. A method for preparing an optically active compound,

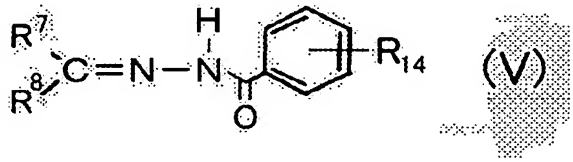
wherein a reaction substrate represented by $R^5R^6C=N-Z$ (wherein R^5 and R^6, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, an alkoxycarbonyl group, and a hydrocarbon group having a functional group and Z represents an aryl group or an acylamino group) and a nucleophilic agent are reacted by nucleophilic addition using an asymmetric reaction catalyst according to claim 5.

14. A method for preparing an optically active compound according to claim 9, wherein the above-mentioned reaction substrate is an imine represented by the following formula (IV):



(wherein, R^7 and R^8, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, and a hydrocarbon group having a functional group and R^9 represents a hydrogen atom or a trifluoromethyl group).

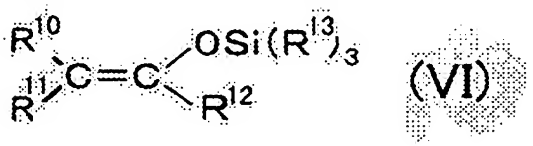
15. A method for preparing an optically active compound according to claim 9, wherein the above-mentioned reaction substrate is a benzoylhydrazone represented by the following formula (V):



(wherein, R^7 and R^8, not being the same, are selected from the group consisting of a hydrogen atom, a hydrocarbon group, and a hydrocarbon group having a functional group and R^{14} represents a hydrogen atom or a substituent having an

electron-withdrawing property).

16. A method for preparing an optically active compound according to claim 9, wherein the above-mentioned nucleophilic agent is a silicon enolate represented by the following formula (VI):



(VI)

(wherein R^{10} and R^{11} are each independently one selected from the group consisting of a hydrogen atom, an aliphatic hydrocarbon group, an aromatic hydrocarbon group, an alkyloxy group, an aryloxy group, and an silyloxy group; R^{12} is one selected from the group consisting of a hydrogen atom, an aliphatic hydrocarbon group, an alkyloxy group, an aryloxy group, an arylthio group, and a alkylthio group; and each R^{13}, being the same or different, represents a hydrocarbon group).

17. A method for preparing an optically active compound according to claim 9, wherein an imidazole derivative is added to the reaction system.

18. A method for preparing an optically active compound according to claim 9, wherein a synthetic crystalline zeolite is added to the reaction system.

19. A method for preparing a optically active compound, wherein a reaction substrate and a nucleophilic agent are reacted by nucleophilic addition using an asymmetric reaction catalyst according to claim 1.

20. A method for preparing an optically active compound according to claim 19, wherein the reaction substrate is an epoxide, the nucleophilic agent is a nitrogen compound, and the optically active compound is a nitrogen-containing compound.